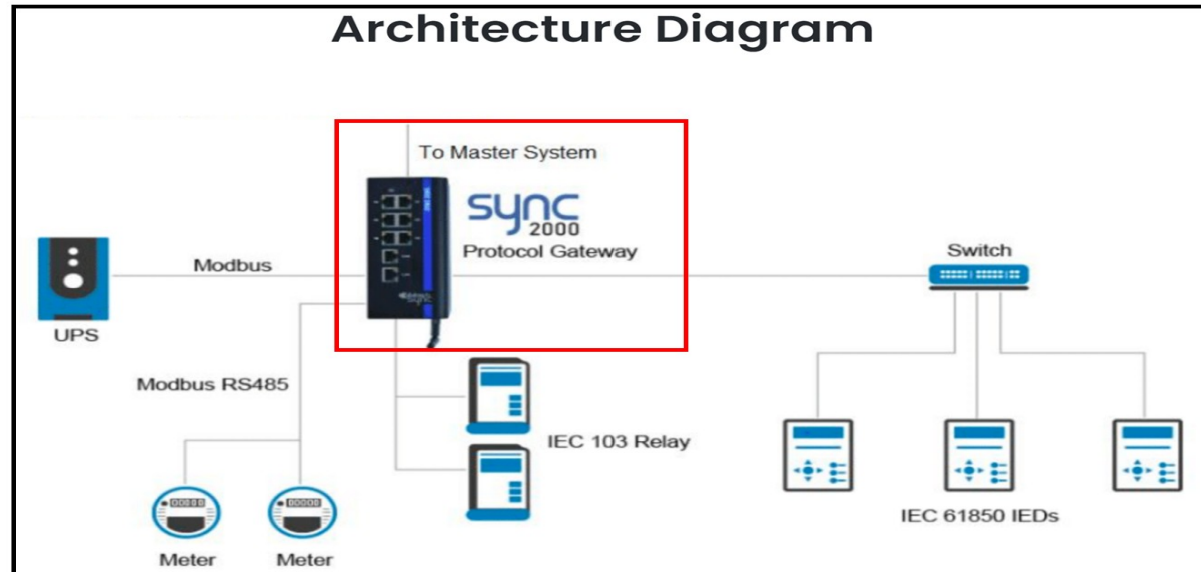


Exhibit 2

U.S. Patent No. 8,488,624 V. Kalkitech

Claim Chart

Claim	Analysis
<p>[1.P] 1. A method for implementing a network interface in a computer network performed by a special-purpose computer programmed by a frame engine comprising:</p>	<p>Kalkitech (“Defendant”) performs a method for implementing a network interface in a computer network performed by a special-purpose computer programmed by a frame engine.</p> <p>This element is infringed literally, or in the alternative, under the doctrine of equivalents.</p> <p>For example, Defendant provides the SYNC 2000 M5 Secure Substation Gateway which is a secure substation gateway which comprises a protocol gateway that supports more than 40 industry standards, proprietary communication protocols, and a multi-faceted security sentry that combines role-based access control, a firewall, security log, and encrypted communications. Further, it is ideal for installing in sub-transmission and distribution substations as a secure data concentrator/gateway for connecting various legacy and new generation downstream devices to a centralized control centre.</p>

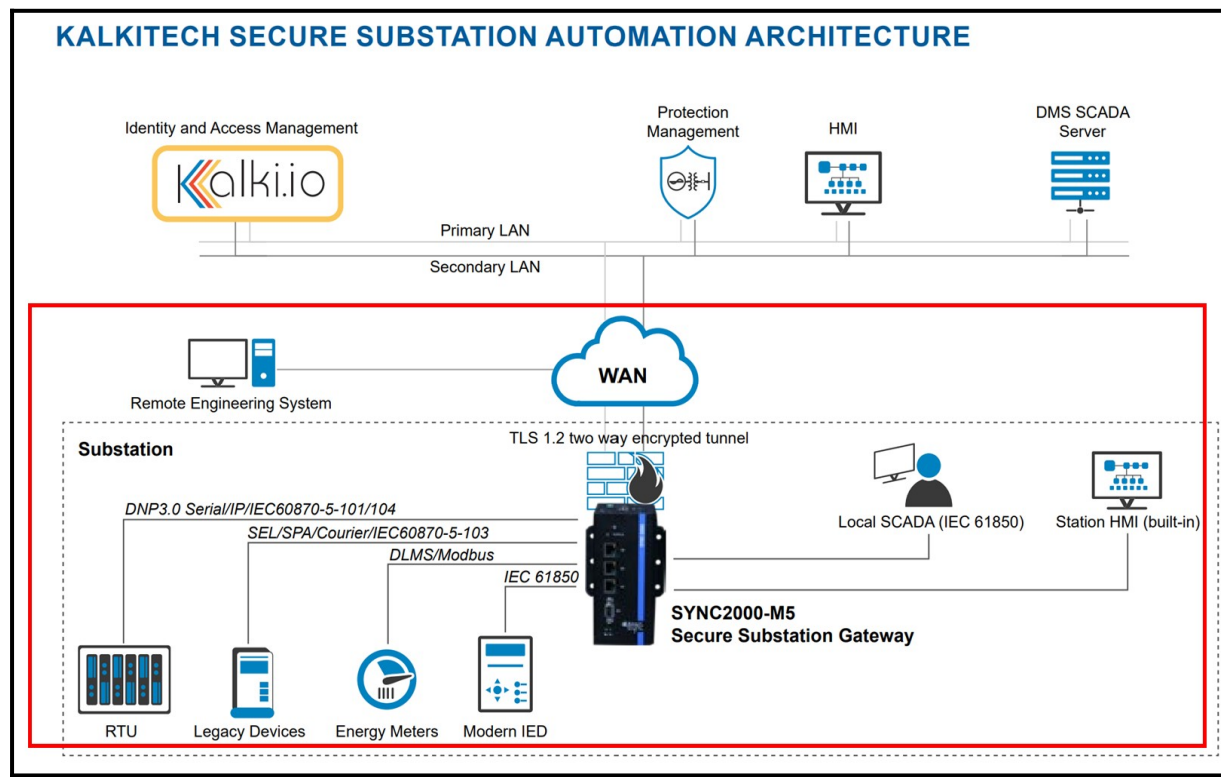


Source: <https://kalkitech.com/products/protocol-converter/sync2000/>

OVERVIEW

SYNC 2000 Protocol Gateways support more than 40+ protocols and is used across utility applications. It features substation rugged hardware with a real time embedded Linux operating system. DNP3.0, IEC 60870-5 101/103/104, DLMS-COSEM, Modbus are some of the standard protocols supported in the product in addition to common proprietary protocols like SPABus, Courer, SEL used by legacy utility grid devices.

Source: <https://www.congnghevienthong.com/upload/files/SYNC%202000.pdf>

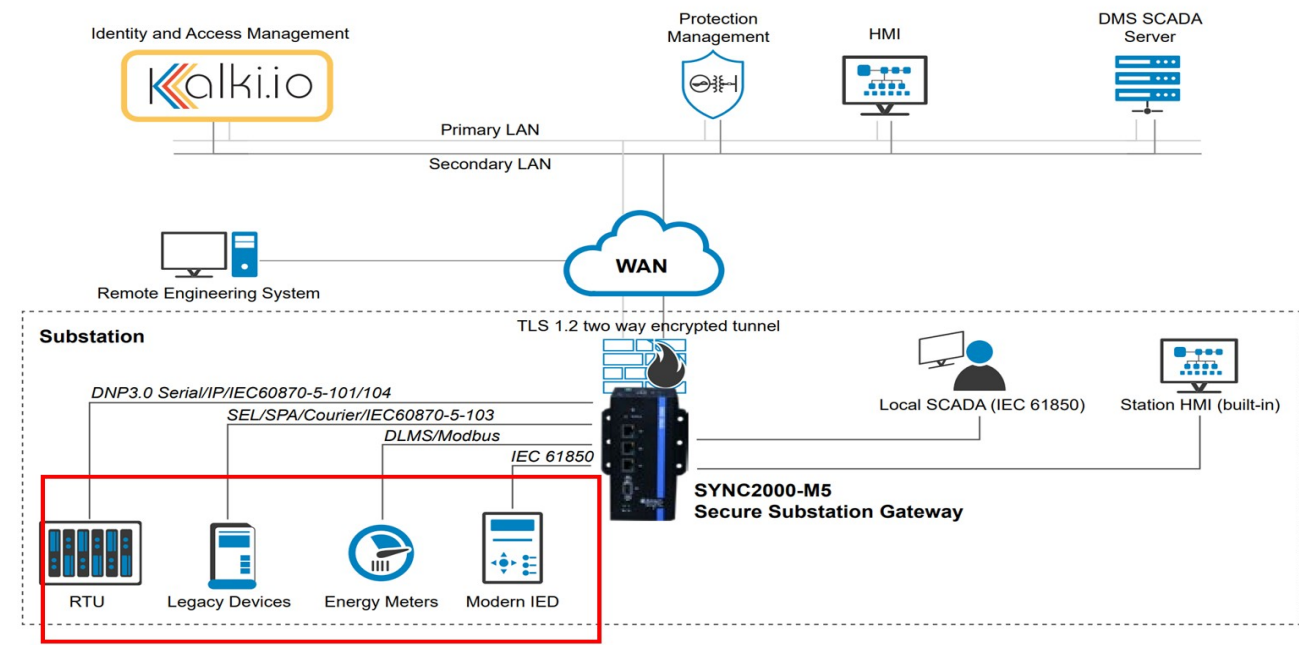


Source:

https://kalkitech.com/wp-content/uploads/2020/08/Secure_Substation_Gateway_Brochure.pdf

	<h2 style="text-align: center;">Why Kalki Edge Gateway?</h2> <div style="border: 1px solid red; padding: 5px;"> <p>Kalki.io Edge software gateway together with the kalki.io Identity Management System (IAM) system provides full-scale role-based access control in order to empower secure access of data. The field devices use a wide range of standards-based and proprietary communication protocols that extend the time and complexity for product vendors to develop technology to convert data. Kalki.io Edge is distributed as a standard installation package deployable on Intel x86 platforms with a standard Linux operating system. Kalki.io Edge software gateway, which is deployable on edge devices,</p> </div> <p>sensors, embedded computers, on-premise servers as well as various low footprint routers in the field has a built-in multi-protocol engine that collects telemetry data from field devices and securely delivers it to external applications/frameworks. With robust and highly scalable architecture, Kalki.io Edge is intended for even low memory and compute footprint, and supports a huge number of industrial, commercial, and utility automation protocols. Irrespective of the device, protocol, or vendor type, Kalki.io Edge software gateway software facilitates edge devices to virtually connect and communicate with any device or system seamlessly.</p> <p>Source: https://kalkitech.com/platforms/kalkiioedge/</p>
<p>[1.1] receiving one or more data packets encoded in a first communication protocol;</p>	<p>Defendant performs the step of receiving one or more data packets encoded in a first communication protocol.</p> <p>This element is infringed literally, or in the alternative, under the doctrine of equivalents.</p> <p>For example, Defendant provides the SYNC 2000 M5 Secure Substation Gateway, comprises a protocol gateway that supports more than 40 industry standards, proprietary communication protocols from major Intelligent Electronic Device (IED) equipment vendors, and a multi-faceted security sentry that combines role-based access control, a firewall, security log, and encrypted communications. When deployed in utility substations it can connect and collect real time data, historical/profile data, fault file or event recordings on standard protocols such as IEC 61850, IEC 60870, DNP3.0 and Modbus, from protection and metering devices.</p>

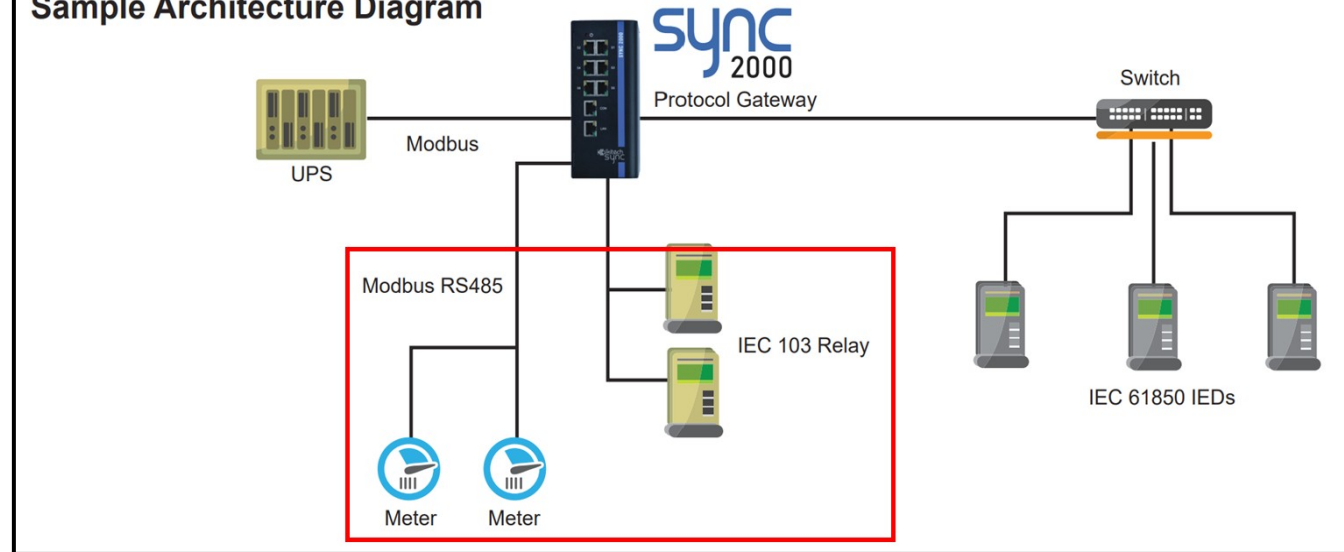
KALKITECH SECURE SUBSTATION AUTOMATION ARCHITECTURE



Source:

https://kalkitech.com/wp-content/uploads/2020/08/Secure_Substation_Gateway_Brochure.pdf

Sample Architecture Diagram



Source: <https://www.congnghevienthong.com/upload/files/SYNC%202000.pdf>

To monitor the user actions and security incidents, SYNC gateways use Syslog for logging. User access logs can track operations made to device settings and configuration. As per IEEE 1686 SYNC gateways also log events and alarms which can be monitored from an engineering tool, web HMI or from the remote management system - Kalki.io. These events and alarms can also be mapped to any telemetry protocols for users to monitor these from SCADA systems.

Source: https://kalkitech.com/wp-content/uploads/2020/08/Secure_Substation_Gateway_Brochure.pdf

Specifications		SYNC 2000 - M5
General	Management	EasyConnect configuration utility
		Kalki.io Energy IoT Platform with Identity and access management service
		Web server/SNMP/Telemetry protocols
	Maintenance	Debug port or console port
		SSH Interface over secure network
Software Capability	Certifications*	IEC 61850-10, IEC 61850-3, CE
	Protocol Conversion	Many-to-many conversion
	Communication	
	Standard protocol set	IEC 60870-5-101/103/104, DNP3 serial/TCP, Modbus RTU/ASCII/TCP, IEC 62056-DLMS/COSEM, IEC 61850, SFTP, SNMP Manager, SNMP Agent
	Proprietary protocol set	ABB - RP570, ABB- RP571, ABB SPA bus, Areva Courier, SEL Fast Message, Event Logger
		Refer to the full list of protocols at https://www.kalkitech.com/knowledge-center/protocols/
	Time synchronization	SNTP, NTP, IEC 60870-5-101/103/104, DNP3.0
	Redundancy	Device Redundancy (Hot-Standby)
		Downstream/upstream communication

Source: https://taat.pe/wp-content/uploads/2020/10/RTU_Sync2000_Brochure.pdf

FEATURES

Software Features

- Supports more than 40 utility protocols
- Automatic startup, initialization with restart notification following power restoration
- Multi-master communication capability
- Up to 10000 data points supported[#]
- Time sync based on NTP/SNTP/NMEA/protocol specific synchronization (IEC 104/DNP3.0 etc.)
- Transparent/tunneling support for remote configuration and disturbance record collection
- Remote device management from Kalki.io
- SNMP Agent/ Manager for NMS integration
- Can be used as terminal server

Source: <https://www.congnghevienthong.com/upload/files/SYNC%202000.pdf>

Why Kalki Edge Gateway?

Kalki.io Edge **software gateway** together with the kalki.io Identity Management System (IAM) system provides full-scale role-based access control in order to empower secure access of data. The field devices use a wide range of standards-based and proprietary communication protocols that extend the time and complexity for product vendors to develop technology to convert data. Kalki.io Edge is distributed as a standard installation package deployable on Intel x86 platforms with a standard Linux operating system. Kalki.io Edge software gateway, which is deployable on edge devices, sensors, embedded computers, on-premise servers as well as various low footprint routers in the field has a built-in multi-protocol engine that collects telemetry data from field devices and securely delivers it to external applications/frameworks.

With robust and highly scalable architecture, Kalki.io Edge is intended for even low memory and compute footprint, and supports a huge number of industrial, commercial, and utility automation protocols. Irrespective of the device, protocol, or vendor type, Kalki.io Edge software gateway software facilitates edge devices to virtually connect and communicate with any device or system seamlessly.

Source: <https://kalkitech.com/platforms/kalkiioedge/>

Features

- Remote monitoring and management using KALKI.IO
- A multi-protocol gateway to interface with SCADA level
- Proven sturdy interoperability with thousands of devices used in the solution for electrical substation
- Various options to synchronize the time of the gateway with end devices

Source: <https://kalkitech.com/platforms/kalkiioedge/utility-gateway/>

[1.2] decoding the Defendant performs the step of decoding the data packets into a set of data objects

data packets into a set of data objects wherein the data packets are decoded in accordance with a machine-readable set of protocol frame definitions containing one or more sub-fields for parsing of the data packets;

wherein the data packets are decoded in accordance with a machine-readable set of protocol frame definitions containing one or more sub-fields for parsing of the data packets.

This element is infringed literally, or in the alternative, under the doctrine of equivalents.

For example, Defendant's SYNC 2000 M5 Secure Substation Gateways can collect IED data which can be stored, processed and converted to any telemetry protocol for transfer to the control center. This data can also be sent to a local SCADA station or over the built-in web HMI interface. In addition to data collection, it can also be used to create a direct tunnel from a central protection management system to IEDs for remote configuration and parameterization. Furthermore, this series gateways support, JSON (JavaScript Object Notation), https and REST APIs tools to enable on-premises systems which can be tailored to meet specific customer requirements. Thus, this platform processes raw data into insightful information, before transmission to the cloud. This not only reduces costs by minimizing the amount of data uploaded, but also facilitates data visualization on digital dashboards.

Connectors/APIs for 3rd Party Integration

- REST APIs with JSON data format
- Framework to build connectors to applications
- Data sources for JDBC SQL queries
- Domain specific data modelling aligned to standards such as IEEE2030.5, DLMS/COSEM, IEC61850, CIM

Source: https://kalkitech.com/wp-content/uploads/2021/10/WP030021_Data-hub-accelerating-digital-transformation-journey-for-utilities-2.pdf

Kalki.io Edge Software

Kalki.io Edge is an edge software for gateway vendors and system integrators for accelerating the collection, aggregation, and protocol conversion of field device data from many vendors. It simplifies and speeds up the collection, aggregation, and protocol conversion of field device data from many vendors.

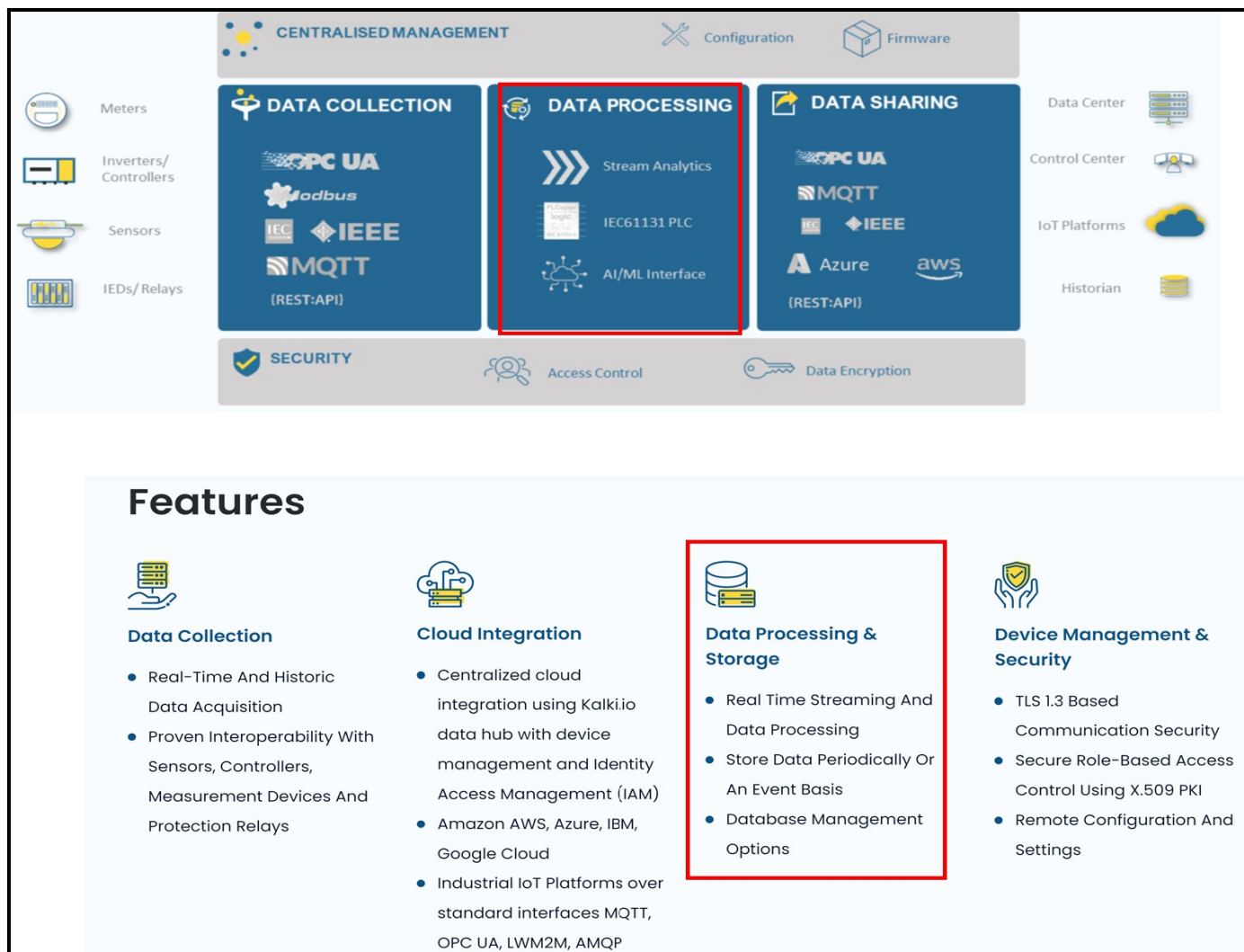
Source:

https://www.ase-systems.com/products/kalkitech-products-platform/#Kalkitech_SYNC_Products

Kalki.io Edge Software Gateway

Kalki.io Edge software is a multi-protocol gateway solution that enables utilities, residential, industrial, commercial and system integrators and Original Equipment Manufacturers (OEM) to engineer solutions based on cloud and IIoT technologies and thereby improve efficiency, a better life for assets, and reduce the operational and maintenance cost.

Kalki.io Edge an embedded software ideal for **edge gateway** vendors or system integrators simplifies and accelerates the acquisition, aggregation, and analysis of data from vendors' field devices such as controllers, sensors, meters, PLCs, machines, protection relays, and other similar devices along with real-time protocol conversion and historical data exchange with external systems securely. The major highlight of Kalki.io Edge is that this **Edge software gateway** enables data acquisition and analysis in ways that facilitate quick decision making, and ultimately increase the efficiency of the field assets.



Source: <https://kalkitech.com/platforms/kalkiioedge/>

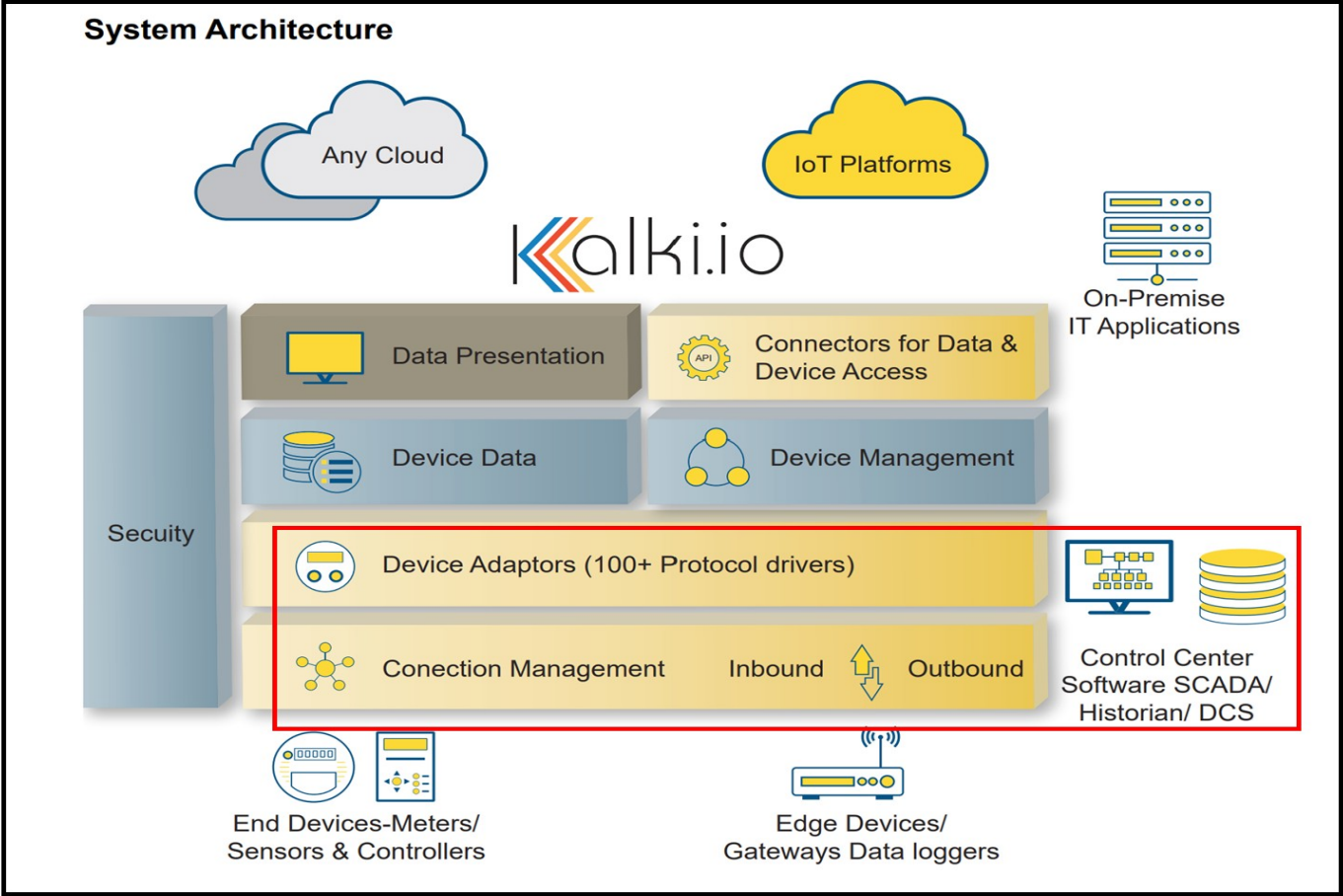
Kalkitech has been shipping the SYNC 2000 family for more than 12 years and is renowned for its protocol technology and expertise across its products and services. In addition to communicating with any IED, the SYNC 2000 has the ability to streamline operations by converting fault record data from a proprietary format to an industry standard format such as COMTRADE before sending it to a data center for analysis. It supports industry standard protocols (including IEC 61850 ed2.0, IEC 60870-5-101/103/104, DLMS/COSEM and Modbus) as well as proprietary protocols (such as ABB SPA Bus and Alstom Courier).

Source: <https://www.ase-systems.com/kalkitech-unveils-new-sync-2000-secure-substation-gateway-platform/>

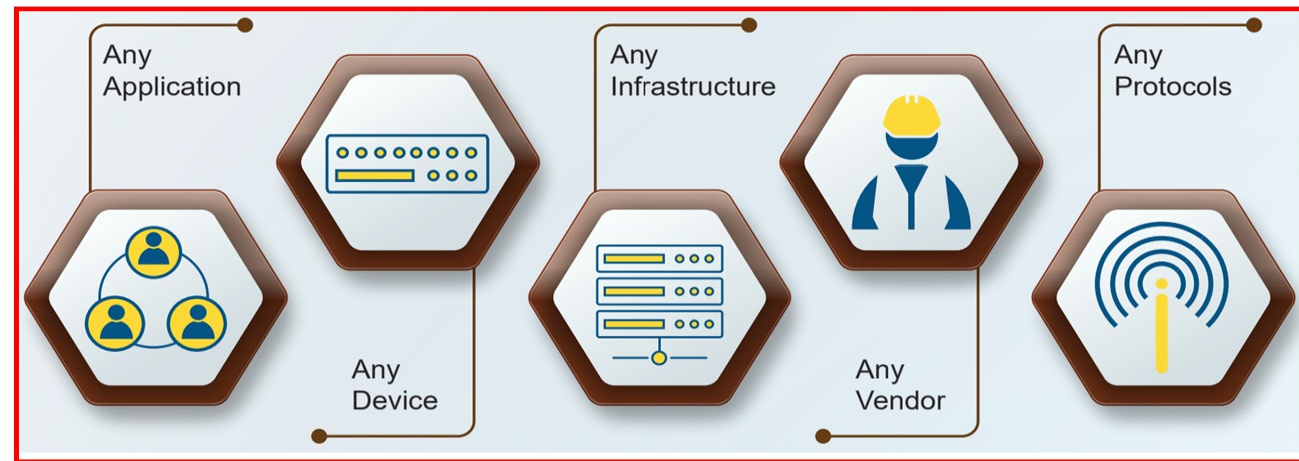
Kalkitech has been specializing in the field of utility protocol conversion libraries and has integrated its technology into this smart energy platform. Thus, whether dealing with the operations technology domain, where you have to work with legacy as well as proprietary energy protocols, or with the information technology domain, where you need to work with https, REST or cloud, kalki.io can do it all.

Kalki.io has a great advantage over other IoT platforms due to the long legacy and strong technology foundation underpinning the SYNC product portfolio from Kalkitech, which is designed to seamlessly work with the platform. The SYNC line includes products such as protocol converters, RTU'S, gateways and data concentrators, as well as device communication enablers such as boards for OEM vendors to integrate into their devices to enable communications using standard protocols.

Source: <https://kalkitech.com/wp-content/uploads/2020/12/WP030015.pdf>



*Utility data hub shall include data collection headend for telemetry data, metering data, DER data, and IoT data either directly or through an edge gateway to provide an All-In-One data collection system that helps migrate existing automation systems to address the challenges stated above. Kalki.io Utility data hub is a platform designed to address utility specific needs of data exchanging i.e., communicating between **any device** connected in the grid over **any communication network** and **any application** that process device data in **any deployment environment/infrastructure** such as cloud or on-premises. Kalki.io platforms address unique power utility requirements such as real time and continuous monitoring, domain specific information models, industry specific protocols for talking to all types of devices, enables multi stake holder involvement with role-based access of collected data, securing legacy systems through state-of-the-art identity and access management, support for coexistence of legacy devices and new IoT enabled sensors achieving IT-OT integration. In short, Kalki.io is **All-in-One data acquisition package** that can simplify the data acquisition requirements of a Utility.*



Source: https://kalkitech.com/wp-content/uploads/2021/10/WP030021_Data-hub-accelerating-digital-transformation-journey-for-utilities-2.pdf

[1.3] and encoding the data objects into a second communication protocol wherein the data objects are encoded in accordance with the machine-readable set of protocol frame definitions.

Defendant performs the step of encoding the data objects into a second communication protocol wherein the data objects are encoded in accordance with the machine-readable set of protocol frame definitions.

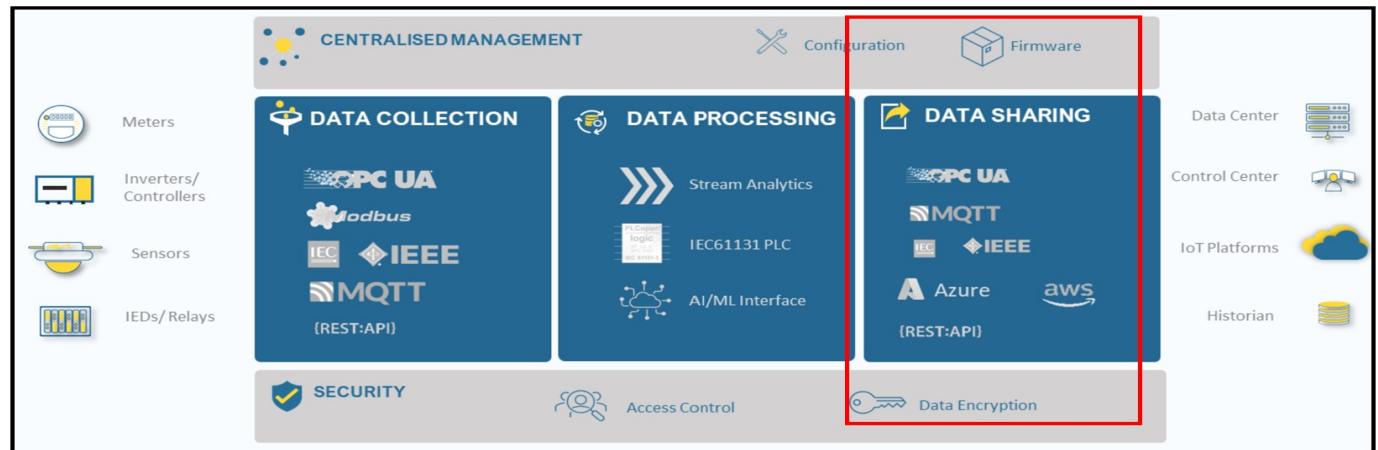
This element is infringed literally, or in the alternative, under the doctrine of equivalents.

For example, Defendant's SYNC 2000 M5 Secure Substation Gateways have field-proven and support a wide range of communication protocols including IEC 60870-5-101/103/104, DLMS/COSEM, Modbus, as well as legacy and proprietary protocols such as SPA, SEL, Courier and many more. The product complies with security features like integrated firewall; TLS/IEC 62351-3 communication, standard, security log recording access, events and alarms, and encrypted communications. Further it consists of Kalki.io which is a Data acquisition middleware as a Service for Telemetry, IoT, Metering applications which supports Internet of Things (IoT) protocols such as MQTT, CoAP, AMQP which helps in connecting latest IoT based sensors/edge devices in the field. It provides various connectors on Web-socket, REST APIs, MQTT etc for integrating with IT applications, it also has native connectors for popular cloud platforms and asset performance management applications.

Substation gateways which are the access point or electronic security perimeter to the substation network are a critical asset and should incorporate a layer of security protection. An open standards-based, layered architecture is essential for utilities. Substation gateways should be highly available devices which ensure the confidentiality and integrity for engineering access and SCADA data conforming to NERC CIP critical infrastructure guidelines with real time access to key operations. They should defend against intrusions, man-in-the-middle and denial of service attacks as well as detect and log cybersecurity incidents and anomalies.

Source:

https://kalkitech.com/wp-content/uploads/2020/08/Secure_Substation_Gateway_Brochure.pdf



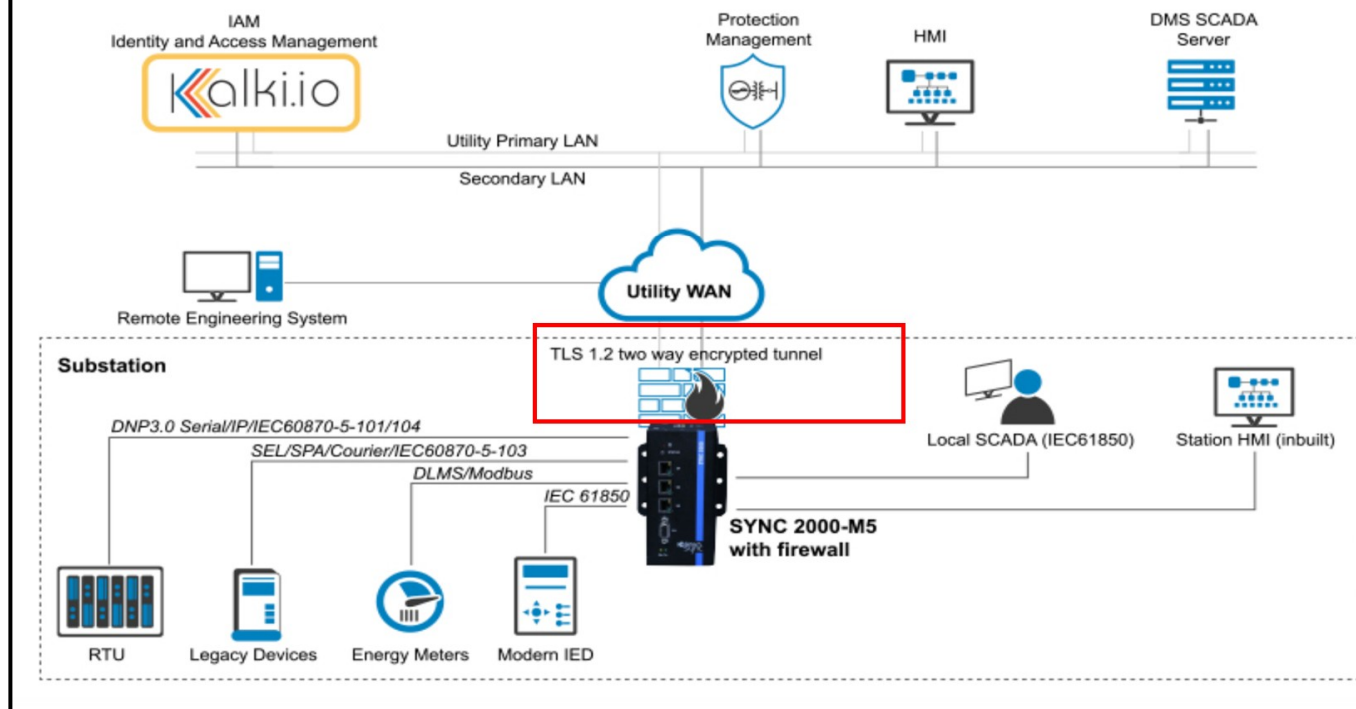
Source: <https://kalkitech.com/platforms/kalkiioedge/>

• IoT Data Hub

Kalki.io supports Internet of Things (IoT) protocols such as MQTT, CoAP, AMQP which helps in connecting latest IoT based sensors/edge devices in the field. Kalki.io device profile-based modelling helps in creating virtual replica of the devices and perform remote setting and configuration management of the field devices. Grouping of devices and group-based management of devices helps to roll out configuration and firmware updates faster. Kalki.io provides various connectors on Web-socket, REST APIs, MQTT etc for integrating with IT applications, it also has native connectors for popular cloud platforms and asset performance management applications. Kalki.io can auto scale to million+ device connections as system scales horizontally or vertically.

Source: https://kalkitech.com/wp-content/uploads/2021/10/WP030021_Data-hub-accelerating-digital-transformation-journey-for-utilities-2.pdf

Architecture Diagram



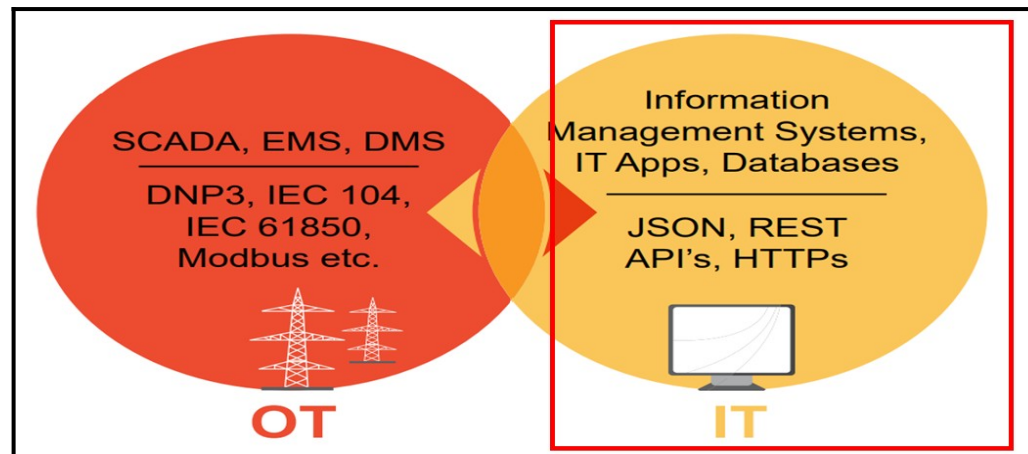
Source: <https://kalkitech.com/products/data-concentrator/sync-2000-m5/>

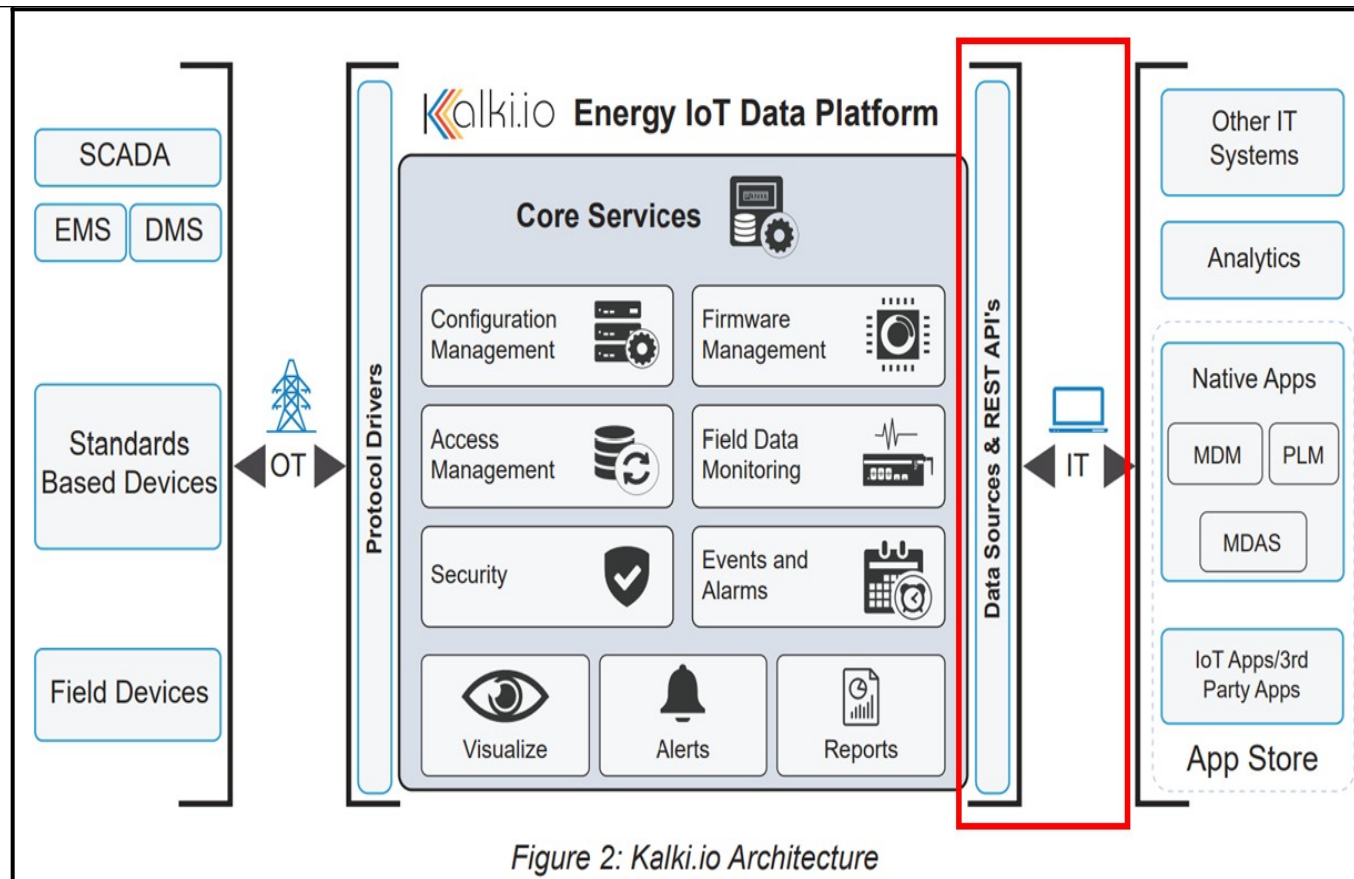
Key Features

General

- License option to enable standard protocols DNP3.0, IEC 60870-5 101/103/104, DLMS- COSEM, Modbus, IEC 61850 ed2.0, and previous editions.
- Supports proprietary protocols such as SPA, Courier, SEL, and many more which are commonly used in utility legacy devices
- Many-to-many protocol conversions with multi-master connection support
- Device software and hardware status, restart notification, and many more diagnostic points
- Remote management and monitoring using Kalki.io
- SNMP agent/manager support to enable network asset monitoring
- Transparent tunneling for remote management of end devices
- Multiple options to synchronize the time of the gateway and downstream devices (NTP/SNTP/IEC 60870-5/DNP3 etc.)
- Integrated Web HMI

- Password protection
- Software license protection
- Digital right management
- Integrated with kalki.io identity and access management
- Role based access control using Attribute certificate based on IEC 62351- 8/OCSP
- Allows only signed firmware bundles from trusted sources
- Encrypted tunnel for configuration access and web-monitoring
- IEC 62351-3 transport layer security for TCP based utility protocol
- IEC 62351-5/Secure authentication for DNP3.0
- SSL based VPN with AES, DES or 3DES encryption over WAN/LAN
- All logs in Syslog format
- Configurable alarms and events for security-related incidents





Source: <https://kalkitech.com/wp-content/uploads/2020/12/WP030015.pdf>